

Appl. No. 10/735,428
Filing Date 12/12/2003

JP920030192US1

REMARKS**1. Posture of the Case**

In a Reply A, filed April 3, 2006, Applicant amended claims 1-4, 8-10, 16, and 17, canceled claims 5-7, and 18, and added new dependent claim 19. In a Supplement to Reply A, filed April 4, 2006, Applicant amended claim 14.

This is a reply to a second non-final Office action in the case.

Informalities

Claims 1, 9, and 17 stand objected to because of informalities. See present Office action, item 3. However, changes suggested by the Examiner in the present Office action were already previously made in a Response to Notice of Non-Compliant Amendment, filed May 10, 2006.

Rejections Under 35 U.S.C. 101

Claims 1-4, 17, and 19 stand rejected 35 U.S.C. 101 on grounds that the claims fail the practical application test. According to the Office action, the claims recite data transformation per se with no tangible result.

In addition, claims 1-4, 17, and 19 stand rejected 35 U.S.C. 101 on grounds that they recite non-statutory subject matter that is directed solely to data transformation with no claimed tangible result. According to the Office action, the result of the claims appear to be a thought (selection) or a mere computation within a processor rather than a real world tangible result that is a practical application of the abstract idea of "selecting."

Claims 8-10 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. According to the Office action, it is reasonable to interpret the system of claim 8 to be software per se, since the specification describes the system as a software system, which the Office action considers per se non-statutory subject matter.

Claims 11-15 stand rejected under 35 U.S.C. 101 on grounds the claimed invention is directed to an operating system kernel, i.e., software, which the Office action considers non-statutory subject matter.

Claim 16 stands rejected under 35 U.S.C. 101 on grounds the claimed invention is directed to a "module," which the Office action considers may be interpreted as software per se.

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Claims 17 and 19 stand rejected under 35 U.S.C. 101 on grounds the claimed invention is directed to non-statutory subject matter. According to Applicant's understanding of the rejection, the Office action holds the software code recorded on computer readable medium may be interpreted as merely a transient signal, wave or other form of energy impressed on a transmission media.

Rejections Under 35 USC 112 1st Paragraph

Claims 11-15 stand rejected under 35 U.S.C. 112, first paragraph, on grounds of failure to comply with the enablement requirement as reciting improper "means plus function" claim language, which the Office action holds is not a proper invocation of 35 U.S.C. 112, 6th paragraph.

Rejections Under 35 USC 112 2nd Paragraph

Claims 8-15 stand rejected under 35 U.S.C. 112, second paragraph, on grounds the claims fail to particularly point out and distinctly claim the subject matter which applicant regards as the invention. That is, the Office action holds claims 8-10 are indefinite because the preamble of claim 8 recite a "computing system," but the bodies of the claims recite only software with no computing system. The Office action holds that claim 9 there is insufficient antecedent basis for the limitation "the set of heuristic variables" in lines 1 and 2 of the claim. The Office action holds that claims 11-15 recite improper "means plus function" claim language on grounds that "an operating system kernel," is software and "means plus function" language is therefore not proper. The Office action holds that in claim 15 there is insufficient antecedent basis for the limitation "said activating means" in lines 1 and 21 of the claims.

Rejections Under 35 U.S.C. 102(e)

Claims 11-14 and 16 stand rejected under 35 U.S.C. 102(e) as being anticipated by Ofer et al. (6,904,470).

Rejections Under 35 U.S.C. 103 (a)

Claim 15 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ofer in view of Structured Computer Organization Second Edition by Andrew S. Tanenbaum.

Allowable Subject Matter

The Office action states that claims 1-4, 8-10, 17, and 19 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 101, 35 U.S.C. 112 1st paragraph,

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and 35 U.S.C. 112 2nd paragraph, and to include all of the limitation of the base claim and any intervening claims.

2. Amendments herein

Claims 11-16 are herein canceled. Claims 1-4, 8-10, 17, and 19 are herein amended to overcome the rejections to those claims.

A computer is obviously a useful machine that can provides concrete, real world results. An input/output scheduler may enable a computer to increase throughput and disk utilization, as well as balance the servicing of multiple hardware devices. Present application, page 2, lines 27-29. This can be a useful, real world benefit. See also, present application, page 1, lines 16-22 ("Input/Output (input/output) schedulers are a component of a computer operating system and typically reside between a core kernel layer/file system layer and various hardware drivers for supporting hardware coupled to the computer. Such hardware typically includes hard disk drives, floppy disk drives, optical disk drives, printers, and scanners. Input/output schedulers receive job requests from upper layers of the operating system and determine the order, number, and fashion in which those jobs are submitted to underlying hardware drivers.")

In prior art input/output scheduling, however, there are obstacles to reliably producing an improvement in throughput, disk utilization, and hardware device service fairness, particularly if a single input/output scheduler is used. See present application, page 3, lines 31-32 ("Due to the nature, variable frequency and competing demands of input/output jobs, it is difficult, if not impossible, for an input/output scheduler using any given scheduling algorithm to obtain the desired goals of maximum throughput and disk utilization whilst maintaining fairness among competing processes."). See also, present application, page 4, lines 16-23 ("Attempts to address every situation within a single scheduler usually result in a compromised implementation of any algorithm. The system fails to deliver the potential throughput capabilities of the system hardware. Utilizing the wrong algorithms for given workloads typically results in large latencies, irrespective of the speed of the processor, amount of memory on board, or other system parameters. Accordingly, if a system is implemented with a single type of scheduler, then that system should be dedicated to a certain kind of workload to provide acceptable performance.")

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Use of multiple input/output schedulers is known, which has promise for assuring reliability of improvement in throughput, disk utilization, and hardware device service fairness. However, this presents the problem of how to select among the schedulers. The present application sets out, on page 4, line 24 through page 5, line 15, examples of prior art attempts to improve input/output scheduling by using multiple schedulers and concludes that for each of the attempts dependency on external interaction is an obstacle. The present invention offers reliability of a useful improvement in computer system input/output performance. Such performance may include, for example, throughput, disk utilization, and hardware device service. This is a useful, tangible, and concrete result in a real world machine that is obtained through better selection among multiple input/output schedulers.

In order to more particularly point out that the claimed invention is directed to this useful, tangible and concrete result for a real world machine, Applicant herein submits amendments to claims 1, 8 and 17, as set out herein above. No new matter is added, since the original application provides support for the amendments. As described herein immediately above.

Certain claims are also amended as set out herein above to improve punctuation, format or readability. No new matter is added, since the claims themselves provide support for these minor corrections.

Regarding the rejection of claims 8-10 on the basis that they are indefinite because the preamble of claim 8 recites a "computing system," but the bodies of the claims recite only software with no computing system, in order to overcome the rejection claim 8 is amended to state in the body of the claim that the system includes a processor and tangible, computer readable memory having instructions as set out in the claim. No new matter is added since the original application provides support. Present application, page 18, line 10 – page 19, line 20.

Regarding the rejection of claim 9 on grounds there is insufficient antecedent basis for the limitation "the set of heuristic variables" the claim is herein amended to state "the heuristic variables." Claim 3 is likewise amended.

Regarding the rejection of claims 17 and 19 on grounds the software code recorded on computer readable medium may be interpreted as merely a transient signal,

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wave or other form of energy impressed on a transmission media, claim 17 is herein amended to state that the computer readable medium is a tangible computer readable medium and that the computer program instructions are fixedly recorded therein. No new matter is added, since the original application provides support. Present application, page 18, lines 24-31 ("The memory 550 includes random access memory (RAM) and read-only memory (ROM), and is used under direction of the processor 540 . . . The storage device 555 can include a disk drive or any other suitable storage medium.").

PRIOR ART OF RECORD

Applicant has reviewed the prior art of record cited by but not relied upon by Examiner, and asserts that the invention is patentably distinct.

REQUESTED ACTION

For the above reasons, Applicant contends the invention as in the claims set forth herein above is patentably distinct. Applicant requests that Examiner grant allowance and prompt passage of the application to issuance.

Respectfully submitted,


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